

REMARKS

Applicant respectfully requests that the foregoing amendments be made prior to examination of the present application.

Claims 1-15 are currently being cancelled.

Claims 16-45 are being added.

After amending the claims as set forth above, claims 16-45 are now pending in this application of which claims 16 and 31 are independent.

Amendments to the Specification

The specification has been amended to be in a format more typical for US applications. Paragraph numbers have been added. No new matter is believed to have been added.

Amendments to the Claims

Claims 1-15 have been cancelled, re-written and re-ordered as claims 16-30 to better comply with USPTO standards.

New Claims

Claims 16-30 correspond to original Claims 1-15, but have been reordered. Claims 31-45 have been added. Claims 16-45 are believed to be supported by the specification as filed, including by at least original claims 1-15.

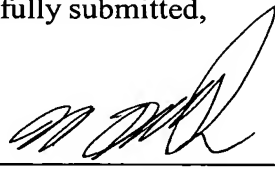
Conclusion

Applicant believes that the present application is now in condition for allowance. Favorable consideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

Date Feb. 28, 2005

By 

FOLEY & LARDNER LLP
Customer Number: 26371
Telephone: (414) 297-5839
Facsimile: (414) 297-4900

Marcus A. Burch
Attorney for Applicant
Registration No. 52,673

LINING ELEMENT FOR THE INTERIOR OF A VEHICLE

CROSS-REFERENCE TO RELATED APPLICATIONS

5

This application is a National Stage of application PCT/EP03/09019, filed August 14, 2003, and claims priority to DE 102 40 270.1 filed August 31, 2002, the disclosures of which are incorporated herein by reference in their entirety.

10

DescriptionFIELD

The invention relates to a ~~lining~~ element for the interior of a vehicle, in particular a motor vehicle, ~~having a base part, which, on its and a surface side facing the interior of the vehicle, and suitable for emitting light, is provided with a~~
15 ~~translucent covering layer.~~

Prior artBACKGROUND

Conventional lining elements are typically can be comprised of ~~DE 198-22 425 C1~~ discloses a lining part of the generic type for use in the interior of a motor vehicle. One exemplary embodiment ~~It~~ comprises a transparent, light-conducting base part which, on the side of the interior of the vehicle, is equipped with a covering layer of natural stone. The natural stone is cut sufficiently thinly to permit the passage of light in order to achieve an optical effect and is joined to the
25 base part by means of an adhesive. As an option, the covering layer can also be provided with a tacky clear varnish which, in the event of a fracture of the natural stone caused by an accident, prevents splinters flying about.

This rather exotic construction can naturally more likely be used in small,
30 in particular narrow, components, for example decorative strips. As a result of the materials used on the side of the interior, lining parts of this kind have a hard surface with a correspondingly unpleasant feel.

Another exemplary embodiment comprises ~~Furthermore, in the document~~
35 ~~DE 198 45 100 A1~~ a lining element ~~part is also disclosed~~ which has an elastomeric,

possibly also transparent, external material which is let into a receptacle in the base part with a form fit. In order to achieve optical effects, an illumination device can be embedded in the external material.

In this construction, although a pleasing feel can be produced, the optical impression is unsatisfactory because of the locally different intensity of light. Thus, there is a need for a lining element for the interior of a vehicle that is designed such that it can is-both maintains a pleasing feel and provides a satisfactory optical impression.

ObjectSUMMARY

~~The invention is based on the object of providing an optically and haptically pleasing lining part, which can also be formed with a large area, having a light-emitting surface.~~

~~Achievement~~

Some embodiments provide an optically and haptically pleasing lining part, which can also be formed with a large area, having a light-emitting surface.

Some embodiments are directed to a lining element for the interior of a vehicle, in particular a motor vehicle, having a base part, and a surface side facing the interior of the vehicle, and provided with a translucent covering layer suitable for emitting light.

According to an embodiment of the invention, a lining element for the interior of a vehicle is comprised of a covering layer, a base part, and a surface side facing the interior of the vehicle and suitable for emitting light. ~~the object is achieved in that the covering layer is designed to be elastically compressible.~~ The covering layer can be designed to be elastically compressible. Further, the covering layer is preferably can be designed to be translucent, its optical transmissivity being 1 to 25%, and in the visible spectral range being (380 nm to 780 nm, usually measured at 550 nm) being 1 to 25%, in particular 5 to 10%. In some embodiments, the optical transmissivity may be 5 to 10%. This translucency may be is firstly sufficient in order still to emit a noticeable amount of light from

the light generator 7 into the interior 4 of the vehicle and, secondly, may still lead to an extraordinarily uniform emission of light being achieved which can be pleasantly glare-free even in darkness.

5 ~~According to a particular embodiment of the invention, t~~The base part can be designed as a plate-like optical conductor which operates in conjunction is operationally associated with an illumination device, for example an incandescent lamp or a light-emitting diode (LED). The optical conductor can preferably be comprised ~~consists of~~ a transparent plastic. For instance, the optical conductor can
10 be comprised of transparent plastics, including, but not limited to, , in particular PMMA or PC. The , and has a structure of the optical conductor can be such that ~~by means of which it is possible to bring about an output of light can be output on~~ the surface side of the optical conductor, which ~~facesing~~ the interior. Structures of this type can be produced, for example, by ~~means of~~ laser removal or a ~~treatment~~
15 ~~by means of~~ sandblasting on the surface of the optical conductor, but can also be produced by structuring the mold for injection molding or in the printing process. Depending on the selected formation, the structure can be arranged on one of the two or even both the surface sides or, if appropriate, even within the optical conductor.

20

In an alternative embodiment of the invention, Alternatively, provision can ~~be made for the plate-like base part can be to be formed~~ directly as a light generator and, for example, ~~to comprise~~ an electroluminescent film (EL film). EL films are light-emitting films which can be cut and deformed three-dimensionally
25 and which, as Lambert radiators, as they are known, emit virtually monochromatic light which is uniform in any viewing direction and extends from blue to yellow (480 nm to 580 nm) and also mixed colors thereof, for example white. ~~In principle, H~~however, other flat light emitters, for example OLEDs (organic light-emitting diodes) or polyLEDs, can also be used.

30

The translucent, elastically compressible covering layer can be comprised ~~preferably consists of~~ an elastomer such as , in particular EPDM, silicone or polyurethane which, over its entire thickness or ~~else only~~ partially, has a foam structure that reduces its hardness. The elastomer can have a ~~advantageously has a~~
35 hardness of 20 to 70 Shore A at room temperature, ~~in particular about 40 Shore A,~~

~~in order to~~ impart to the lining element overall a pleasing feel under the atmospheric conditions prevailing in the interior of the vehicle. According to some of these embodiments, the elastomer may have a hardness of about 40 Shore A.

5 According to another embodiment of the invention, the covering layer can comprises a layer facing covered toward the interior of the vehicle, the layer comprised of by means of a film and made of a gel-like substance which, at room temperature, can have~~preferably~~ has a dynamic viscosity of 0.01 to 10 Pa.s., ~~in particular 0.1 to 1 Pa.s (like honey)~~ and, under local pressure being applied to the
10 surface side of the lining element, (touching the surface of the lining element on the side of the interior) escapes to the side in a viscid manner into the remaining gel-filled gap underneath the film.

 The gel-like substance can be ~~is preferably~~ arranged between two films
15 and, in this form, can be adhesively bonded to the flat base part. The film on the side of the interior can be composed such that it has a relatively low thickness, yet sufficient strength to perform its function. ~~must firstly have a relatively low thickness, in order in turn not to increase the stiffness of the covering layer excessively, but secondly must have sufficient strength.~~ For instance By way of
20 example and not by limitation, polyurethane films with a thickness of 0.1 to 1.5 mm are suitable. Additionally, ~~in particular of 0.5 to 1.0 mm,~~ are suitable.

———Tthe thickness of the covering layer, overall is can be preferably 1.0 to 5.0 mm, in particular 2.0 mm to 3.0 mm, which may result in their edges being
25 provided with visible and palpable curves which optimize the overall impression of the lining element.

BRIEF DESCRIPTION OF THE FIGURES**Figures**

30 The figures illustrate exemplary and schematically different embodiments of the invention.

Fig. 1 shows a longitudinal section of a lining element~~part~~ according to an
first embodiment of the invention ~~in longitudinal section~~

Fig. 2 shows a longitudinal section through a further lining element according to an embodiment of the invention

DETAILED DESCRIPTION

5

The lining element 1 illustrated in Ffig. 1 can comprises a base part 2 having a thickness D_1 and a covering layer 3 having a thickness D_2 . The base part 2 can be is-formed as an injection molding made from a transparent plastic having a structured surface 5 facing the interior 4 of the vehicle. Via an integrally molded lateral optical channel 6 (alternatively also by ~~means of~~ a glass fiber optical conductor), the light generated in a separate light generator 7 in the form of a light-emitting diode 8 (illustrated schematically by the arrows A) can be is-fed by ~~means of~~ a deflection zone 9 provided with mirrored surfaces and formed in the manner of a staircase into the level, flat optical conductor 10 of the base part 2, where it is distributed over the surface of the lining element 1.

Via the structured surface 5, the light can enters the covering layer 3, which can consists of a translucent elastomer and be is attached adhesively bonded to the base part 2. The covering layer can be attached to the base part by any number of
20 suitable means including, but not limited to, being adhesively bonded ~~by means of~~ a transparent adhesive 11. The covering layer 3 ~~has~~ can have two outer layers 12, 13 of compact material and a foamed core layer 14 of foamed material, which can extends parallel to the structured surface 5 of the base part 2. The foamed core layer 14 can firstly increases the compressibility of the covering layer 3 and, can
25 ~~furthermore,~~ makes the passage of light more uniform by means of scattering. Accordingly, tThe lining element 1 can have thus has a uniform emergence of light and a pleasing feel, since the covering layer 3 can be deformed elastically (arrow B). compressibly under the pressure of a touch (arrow B). Rounded edges 15 on
tThe part of the covering layer 3 that projects beyond the edging 16 of the lining
30 element 1 can have rounded edges which may reinforce the positive impression once more if they are touched.

In the embodiment of the invention according to Ffig. 2, the base part 2 can comprises a flat carrier 17, which can be designed as desired with regard to its
35 optical properties and which, on its surface side facing the interior 4 of the vehicle,

~~can be is~~ equipped with a light generator 7. The light generator can be comprised of any suitable film. By way of example and not limitation, the light generator can be comprised in the form of an electroluminescent film (EL Film) 18. The EL Film ~~latter can~~ generates light which enters the covering layer 3 ~~directly very~~ uniformly in the direction of the arrows A.

The translucent covering layer 3 ~~for its part can~~ comprises an upper and a lower translucent, flexible plastic film 19, 20, which ~~can beare~~ joined tightly to each other at the edges. The interspace between the plastic films 19, 20 ~~can be is~~ filled with a turbid, gel-like substance 21, which ~~can~~ escapes laterally (arrow C) in a viscid manner under pressure (arrow B) on the surface of the covering layer 3 that faces the interior.

Irrespective of the embodiment selected, the covering layer 3 ~~can be comprised of a~~ acts in a translucent surface having an manner overall with an optical transmissivity in the visible spectral range of 1 to 25%, in particular 5 to 10%. This translucency ~~is~~ can firstly sufficient in order still to emit a noticeable amount of light from the light generator 7 into the interior 4 of the vehicle and, secondly, ~~can~~ still leads to an extraordinarily uniform emission of light being achieved which ~~is~~ can be pleasantly glare-free even in darkness. ~~Furthermore, it is possible to provide the~~ In some embodiments, the covering layer 3 can have ~~a additionally with a translucent textile covering.~~ In another alternative embodiment, the covering layer can be covered with the desired translucency is maintained overall. It is likewise possible to produce this by means of the application of a thin opaque layer which may be applied to an intrinsically transparent base body.

The lining element according to an embodiment of the invention can ~~in principle be~~ designed in any desired shape and size. By way of example and not limitation, the lining element can be designed to be any one of; afor example even as three-dimensionally shaped roof linings, a door cladding, a pillar cladding, a sun visor or a rear cladding of the backrest of a vehicle seat. By means of the illumination of the lining element can provide, a pleasant ambience can be created in the entire interior of a the vehicle, as ~~but the lining element can be used in the form of~~ an orientation light or in conjunction with operating elements.

Reference symbols

- 1 — Lining element
- 2 — Base part
- 3 — Covering layer
- 4 — Interior of the vehicle
- 5 — Structured surface
- 6 — Optical channel
- 7 — Light generator
- 8 — Light emitting diode
- 9 — Deflection zone
- 10 — Optical conductor
- 11 — Adhesive
- 12, 13 — Outer layer
- 14 — Core layer
- 15 — Edge
- 16 — Edging
- 17 — Carrier
- 18 — Electroluminescent film
- 19, 20 — Plastic film
- 21 — Gel-like substance

- D_1 — Thickness of base part
- D_2 — Thickness of covering layer

- A — Arrow (beam path of light)
- B — Arrow (pressure when touched)
- C — Arrow (escaping gel-like substance)